

II. "Researches on the Action of certain parts of the Solar Spectrum upon the Iris." By E. BROWN SÉQUARD, M.D.
Communicated by Dr. SHARPEY, Sec. R.S. Received July 10, 1856.

In 1847 I discovered that light has the power of acting directly upon the iris so as to produce there a muscular contraction, manifesting itself by the constriction of the pupil. If an eye taken out from the orbit is alternately exposed to light and darkness, we find that the pupil becomes alternately constricted and dilated*.

It was interesting to know whether the stimulation of the muscular fibres of the iris is produced by the chemical power of light or not. I had already found, in 1847, that only the parts of light which seem to have but very little chemical action, have the power of exciting contractions in the iris. But my experiments having been made with light passing through coloured glasses, were not decisive. Lately I have performed many other experiments in making use of light decomposed by the prism. In one case, with the assistance of Messrs. Dubosc and Nachet, jun., I experimented with electric light, and in the other cases I made use of direct solar light.

In all these cases the same results have been obtained. I uniformly found that the yellow part of the spectrum acted as well as undecomposed light, and that the other parts of the spectrum had either no action at all, or only a very slight one. The parts of the green and orange adjoining the yellow had a decided but very slow action. The two extremities of the spectrum, and the dark places in their neighbourhood, not only had no constrictive action upon the pupil, but did not prevent it from dilating, and the dilatation seemed to take place as quickly as when the eye was put in complete darkness.

From these experiments it appears that the power possessed by light, of stimulating the circular fibres of the iris, belongs not to its chemical or to its calorific parts, but to its illuminating elements.

* Comptes Rendus de l'Acad. des Sciences, vol. xxv. pp. 482 & 508 ; and Comptes Rendus de la Société de Biologie, vol. i. p. 40.

It seems therefore that it is not by a chemical action, but by a peculiar dynamical influence that light produces contraction of the iris.

The power of the iris to contract when stimulated by light lasts extremely long, particularly in certain animals. In the eel I have found the muscular irritability of the iris, in one case, lasting *sixteen* days, during the last winter, in eyes taken out from the orbit. This is an interesting fact, not only on account of the long duration of vitality in the iris, but on account of the conclusion that we are entitled to draw from it, that muscular fibres may be stimulated without the intervention of nerves. In the iris of the eel the nerve-fibres are found very much altered a few days after the extirpation of the eye from the orbit, and they are almost destroyed twelve or fifteen days after this extirpation, *i. e.* at a time where muscular irritability is sometimes still existing.

III. A paper was in part read, entitled "Photo-chemical Researches.—Part I. On the Measurement of the Chemical Action of Light." By Professor BUNSEN of Heidelberg, and HENRY ENFIELD ROSCOE, B.A., Ph.D. Communicated by Professor STOKES, Sec. R.S. Received November 12, 1856.

November 27, 1856.

Sir BENJAMIN C. BRODIE, Bart., V.P., in the Chair.

Dr. Noad was admitted into the Society.

In accordance with the Statutes, notice was given of the ensuing Anniversary Meeting, and the following names of persons recommended for election as Council and Officers for the ensuing year, were announced from the Chair :—